Bioretention Projects: Innovative Design & Lessons Learned

Monocacy and Catoctin Watershed Alliance

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New Guidance on Bioretention and Rain Gardens

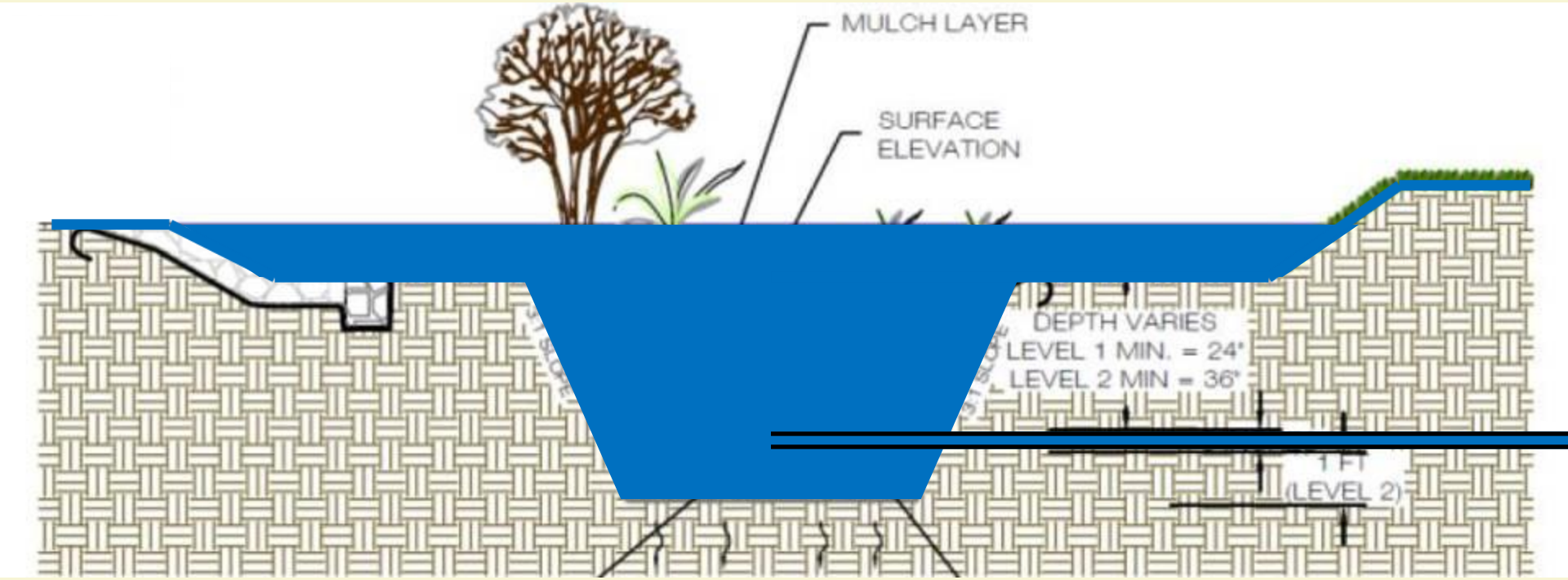
From Chesapeake Stormwater Network:

Technical Bulletin #10: Bioretention Illustrated!

Guide to the Design, Construction, Planting and Upkeep of Your Rain Gardens (and other stewardship projects too!)

http://chesapeakestormwater.net/category/publications/

Photo: Chesapeake Bay Program



1. Drainage Area

Bioretention Storage Goal:

$$WQv = P \times Rv \times A$$

Where: WQv = Water Quality Volume (cubic feet)

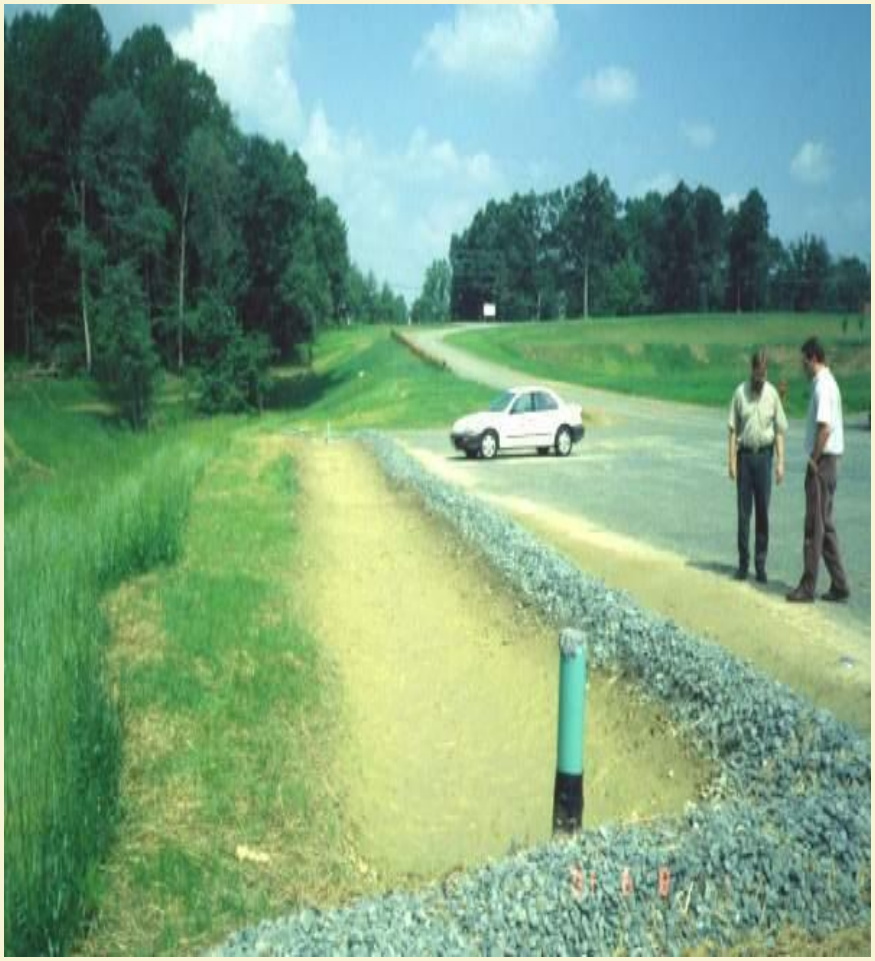
P = 1”/12 (feet)

Rv = .05 + .009 * Imp. %

A = Area (square feet)

*Goal = at least 25% of WQv in urban areas.

1. Drainage Area



Don’t start installation until site is built out and pervious areas are stabilized

Keep construction equipment out of open bioretention sites

2. Sizing

Bioretention Storage Available

Ponding Volume = (Top Area + Bottom Area)/2 x Ponding Depth

Soil Storage = Bottom Area x Soil Depth x 0.25

Total Volume = Ponding Volume + Soil Storage

3. Forebay!

4. Overflow

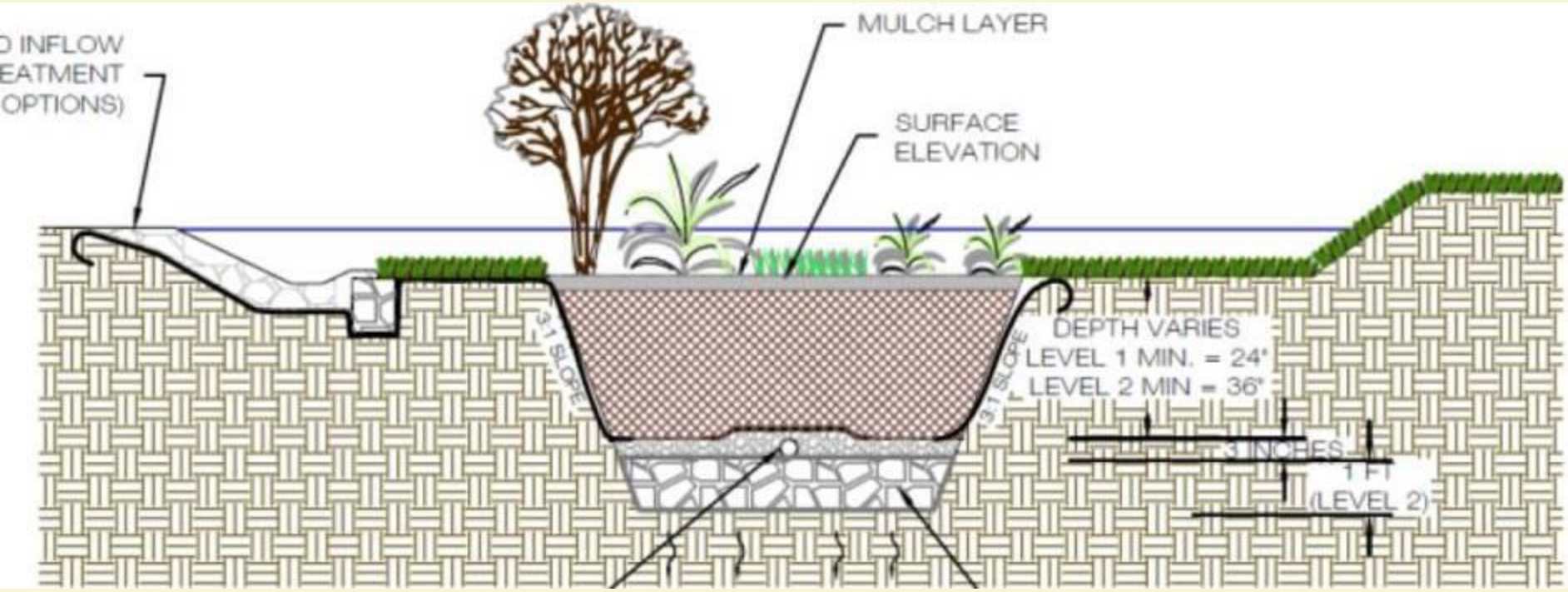
5. Ponding

6. Plants

6. Plants

6. Plants

7. Soil Media



80%-90% Sand

10% - 20% Fines **Low Phosphorus Content!**

3% - 5% Organic Matter

8. Underdrain

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Quick Percolation Test:

1. Dig a hole to bioretention bottom (or deeper)
2. Place 24” tall PVC pipe in hole, with a little sand at the bottom.
3. Fill pipe with water and let it soak in for 24 hours.
4. Fill pipe again, and measure drop for 1 hour.
5. Run several tests for better accuracy.

½” per hour = no underdrain.

Construction

Photo: Chesapeake Bay Program

Excavate From the Side

Install Filter Fabric on Sides Only

Make Sure You Are Getting What You Paid For

Maintenance: Vegetation

Maintenance: Water

Photo: Chesapeake Bay Program

Maintenance: Sediment

Maintenance: Sediment

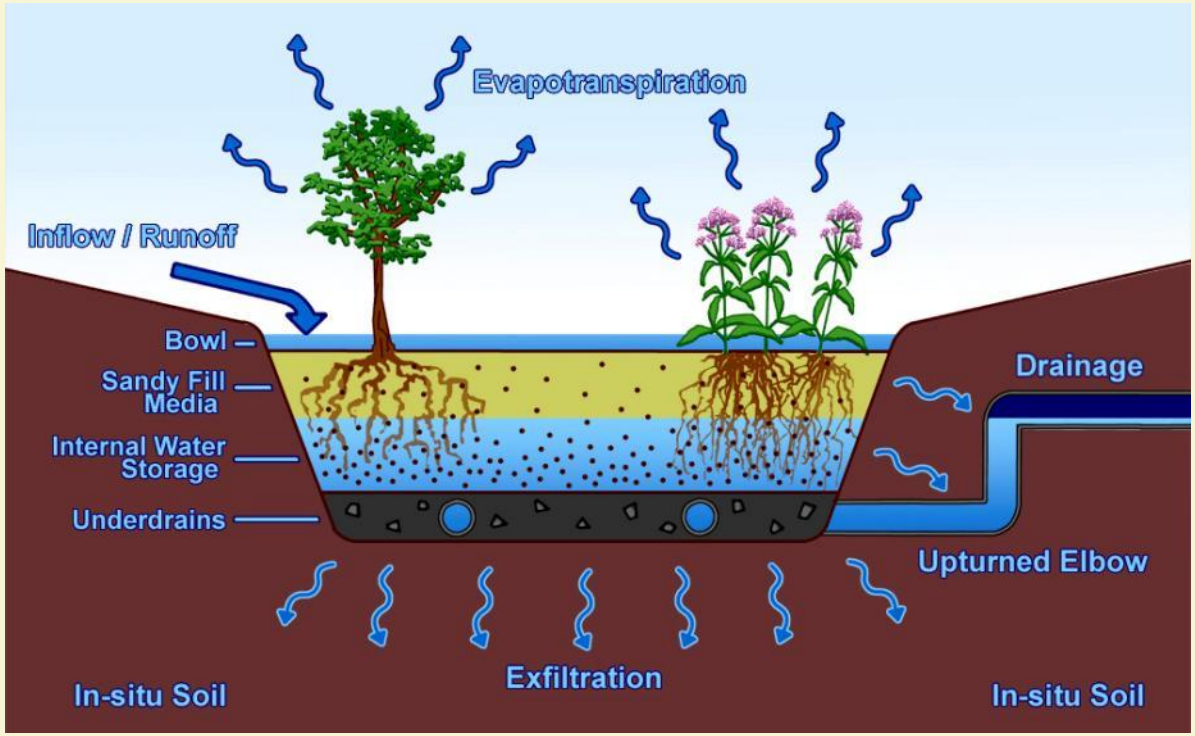
Maintenance: Trash

What's Next in the Stormwater World?

- Better site planning & design techniques

What's Next in the Stormwater World?

- Pollutant Specific Innovations



NC State

What's Next in the Stormwater World?

- "Smart" BMPs